November 2, 2004

EA-04-142

Christopher M. Crane
President and Chief Executive Officer
AmerGen Energy Company, LLC
200 Exelon Way, KSA 3-E
Kennett Square, PA 19348

SUBJECT: FINAL SIGNIFICANCE DETERMINATION FOR A GREEN FINDING
(NRC Inspection Report 05000219/2004003)
Oyster Creek Generating Station

Dear Mr. Crane:

The purpose of this letter is to provide you with the final results of our significance determination of the preliminary Greater Than Green finding identified in the subject inspection report at Oyster Creek during an inspection completed on June 30, 2004. The results of the inspection were discussed with Mr. Swenson and other members of your staff on July 15, 2004. The inspection finding was assessed using the significance determination process and was preliminarily characterized as Greater Than Green, a finding of greater than very low safety significance, resulting in the need for further evaluation to determine significance, and therefore the need for additional NRC action. This preliminary Greater Than Green finding involved the failure to follow procedures during a two-year overhaul of the #1 Emergency Diesel Generator (EDG1) in April 2004. As a result, one pillow block bearing bolt fell out and another loosened during a surveillance test on May 17, 2004, causing excessive vibration and noise that prompted an emergency shut down of EDG1.

In a letter dated August 12, 2004, the NRC provided you an opportunity to attend a Regulatory Conference to discuss this preliminary finding, or to provide a written response. At your request, a Regulatory Conference was held on September 27, 2004, to further discuss your views on this issue. A copy of the handout you provided at the conference has been recorded in ADAMS under accession number ML042860063. During the conference, your staff described the significance of the finding, its root cause, and detailed corrective actions. Specifically, you agreed that there was a performance deficiency, but you contended that this issue should be classified as a Green finding.

Based on our evaluation of the inspection findings, including the additional information you provided at the Regulatory Conference, the NRC has made a final significance determination that the finding is appropriately classified as Green, a finding of very low safety significance. The basis for our determination is documented in the enclosed Final Risk Determination. Nonetheless, the finding is a violation of Technical Specification 6.8.1, which requires you to establish, implement, and maintain written procedures, in part, for maintenance that can adversely affect the performance of safety-related equipment. Specifically, on April 30, 2004, maintenance technicians completed work on EDG1, a safety-related component, without fully establishing and implementing procedural requirements. In particular, the technicians did not

torque two pillow block bearing bolts to the value specified by Maintenance Instruction 1200. However, because the violation had very low safety significance and because it was entered into your corrective action program, the NRC is treating the violation as a non-cited violation in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny the non-cited violation, you should provide a written response with the basis for the denial, within 30 days of the date of this letter, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, Region I, the Director, Office of Enforcement, and the NRC Resident Inspector at Oyster Creek.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS) on the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

A. Randolph Blough, Director
Division of Reactor Projects
Region I

Docket No. 50-219
License No. DPR-16

Enclosure: Final Risk Determination

cc w/encl:
Chief Operating Officer, AmerGen
Site Vice President, Oyster Creek Nuclear Generating Station, AmerGen
Plant Manager, Oyster Creek Generating Station, AmerGen
Vice President - Licensing and Regulatory Affairs, AmerGen
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ENCLOSURE

Final Risk Determination

The NRC issued Inspection Report 05000219/2004003 on August 12, 2004, following completion of an inspection at Oyster Creek. Included in the subject report was a preliminary Greater Than Green finding of greater than very low safety significance that resulted in the need for further evaluation to determine significance. This preliminary Greater Than Green finding involved the failure to follow procedures during a two-year overhaul of Emergency Diesel Generator #1 (EDG1) in April 2004. Specifically, maintenance personnel did not follow procedures and failed to properly torque two pillow block bearing bolts. As a result, during surveillance testing on May 17, 2004, one pillow block bearing bolt fell out and another loosened causing excessive vibration and noise that prompted an emergency shut down of EDG1. At Exelon's request, a Regulatory Conference was held in the Region I office on September 27, 2004, to allow NRC staff to hear Exelon present new information to address the ability of EDG1 to perform its safety function.

Your staff conducted testing with a diesel generator located in Joliette, Illinois, which is similar to EDG1 at Oyster Creek, to demonstrate that EDG1 could run 24 hours in its as-found condition on May 17, 2004. The Joliette diesel generator was setup using the pillow block bearing bolts from EDG1 to mimic the as-found condition at Oyster Creek, i.e., one bolt was removed and the other was backed-out of the bearing. Overall, the test failed to demonstrate a 24-hour run, but it did show that the degraded pillow block bearing remained stable, and that the Joliette diesel generator could operate for several hours in this condition. The Joliette diesel generator automatically shut down when the cooling system overheated due to excessive belt slippage after about 6 hours of operation. Exelon contended that this testing demonstrated that EDG1 would have run for at least 6 hours beyond the point when it was shut down. In addition, Exelon determined that EDG1 had accumulated approximately 3 hours of actual run time during surveillance testing prior to its shut down on May 17, 2004. Therefore, Exelon maintained that the risk calculation supports a finding with Green significance.

The staff agreed with Exelon concerning credit for 3 hours of cumulative run time by EDG1 based on actual surveillance testing conducted after it was declared operable following maintenance on April 30, 2004. However, the staff did not agree that it was reasonable to assume EDG1 would have operated an additional 6 hours based on testing performed on the Joliette diesel generator. The staff considered that the longest continuous loaded operation of the Joliette diesel generator during testing was approximately 4-1/2 hours. While testing distractions occurred, such as a loss of fuel supply and poor performance of the cooling system, the staff focused on the fact that the pillow block bearing did not fail because the remaining bolt in the bearing did not further loosen on the Joliette diesel generator.

Some conservatism in the time allowance was warranted to account for the differences between the engines, while at the same time, making a distinction based on how the pillow block performed versus the overall performance of the Joliette diesel generator. The differences considered were:

(1) the Joliette diesel generator was a 16-cylinder engine while EDG1 was a 20-cylinder engine, which would have resulted in a different torsional impulse on the drive pulley;

(2) the Joliette diesel generator did not operate at full load during the test (1950 kW vs. 2000 kW), which would have slightly reduced the heat load to be dissipated by the cooling system;

(3) the Joliette diesel generator fan drive pulleys were different sizes (and weights) than EDG1, which would have resulted in different tension on the fan drive belt, different loading on the fan drive, and different dynamic forces on the pillow block; and

(4) the cooling system controls on the Joliette diesel generator were different than EDG1.

Based on this information, the staff concluded that 4 hours, vice the 6 hours proposed by Exelon, was appropriate due to uncertainties concerning the differences between the Joliette diesel generator and EDG1. A test with a more representative cooling system could have been performed, but most likely would not have led to a substantially different conclusion. Further, the staff gave no time credit for the possibility of Exelon management making a decision during an emergency that could have directed operators to remove EDG1 from service, tighten the loose bearing bolts, and restart the machine.

Therefore, based on a review of prior surveillance run time information since EDG1 was declared operable on April 30, 2004, credit was given for the demonstrated ability of EDG1 to run for 3 hours for 11.5 days and 1 hour for 6 days. In addition, the staff concluded that it was reasonable to assume that EDG1 would have run for at least 4 more hours given the as-found condition of the pillow block bearing on May 17, 2004. This resulted in the new assumption that EDG1 would have run for at least 7 hours for 11.5 days and 5 hours for 6 days, over the 17.5 days between April 30 and May 17, 2004.

For the 17.5 day period, the NRC's revised Phase 3 risk analysis estimated: (1) the increase in the external and internal core damage frequency (delta-CDF) to be on the order of 8 in 10,000,000 (8E-7), and; (2) the increase in large early release frequency (delta-LERF), using a delta-CDF to delta-LERF factor of 0.1, to be on the order of 8 in 100,000,000 (8E-8). The delta-CDF was dominated by internal event scenarios involving losses of offsite power with subsequent failure of both emergency diesel generators (i.e., a station blackout (SBO)). For the 11.5 day period, the dominant core damage sequences were: 1) an SBO followed by the failure of two safety relief valves to remain closed; and 2) an SBO, assuming that EDG1 would have run for at least 7 hours of its mission time given the condition of the bearing, with the failure to restore AC power from the combustion turbines or offsite power in the subsequent 8 hours. For the 6 day period, the dominant core damage sequences were: 1) an SBO, assuming that EDG1 would have run for at least 5 hours of its mission time given the condition of the bearing, with the failure to restore AC power from the combustion turbines or offsite power in the subsequent 8 hours, and; 2) an SBO followed by the failure of two safety relief valves to remain closed.

Using the assumptions discussed above, the NRC risk analysis concluded that this issue is more appropriately classified as a Green finding, having very low safety significance.